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QUALCOMM, INC 5775 MOREHOUSE DR. SAN DIEGO, CA 92121			TORRES, JOSEPH D	
			ART UNIT	PAPER NUMBER
			2133	

DATE MAILED: 04/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/789,605

Applicant(s)

PAN ET AL.

Examiner

Joseph D. Torres

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s).**

- |                                                                                                                                                 |                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                            | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>01/05/2006</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. Claim 1 recites "A communication device" in the preamble however there is no indication of any relationship between the recited "communication device" in the preamble and the limitations in the body of the claim. See MPEP § 2172.01. The omitted elements are: the relationship between the "communication device" recited in the preamble and the limitations in the body of the claim.

The term "twice the number" in claim 5 is a relative term which renders the claim indefinite. The term "twice the number" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The plurality of third values is not a definite known number, hence it is impossible to determine the significance of "twice the number of the plurality of third values".

Claim 24 refers back to elements in claim 23, but does not depend from claim 23.

Claim 24 should be fixed to depend from claim 23 or the language should be rewritten to remove antecedent basis problems.

Claim 29 recites "A wireless communication device" in the preamble however there is no indication of any relationship between the recited "wireless communication device" in the preamble and the limitations in the body of the claim. See MPEP § 2172.01. The omitted elements are: the relationship between the "communication device" recited in the preamble and the limitations in the body of the claim.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-36 are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility. The limitations in the body of claim 1 only recite storing generating and storing values in memory, but do not indicate any utility. The Examiner would like to point out that the Applicants specification teaches a de-interleaver for a communication device. The Examiner would like to point out that any limitation added to claim 1 indicating the connection that the limitations in the body of claim 1 have to a de-interleaver would overcome the 101-rejection.

The limitations in the body of claim 29 only recite storing generating and storing values in memory, but do not indicate any utility.

The limitations in the body of claim 30 only recite storing generating and storing values in memory, but do not indicate any utility.

The limitations in the body of claim 35 only recite storing generating and storing values in memory, but do not indicate any utility.

The limitations in the body of claim 36 only recite storing generating and storing values in memory, but do not indicate any utility.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 5, 6, 25, 28-30, 35 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul).

35 U.S.C. 102(b) rejection of claims 1, 29, 30, 35 and 36.

Kaul teaches a mapper for receiving a first value and a second value and generating a plurality of third values (S/P block in Figure 5 of Kaul); a plurality of memory banks, each memory bank adaptable to store one of the third values (Memory banks 1A, 1B, 2A and 2B in Figure 5 of Kaul); and a controller for directing each of the plurality of third values to a selected one of the plurality of memory banks for simultaneous storing according to a storing pattern (col. 9, lines 52-54 in Kaul).

35 U.S.C. 102(b) rejection of claim 5.

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Note: the S/P block generates a plurality of third channel A and channel B values and Figure 5 also teaches four memories which is twice the number of channels (Note: a plurality of values for each channel is still a value for each channel at a particular time since it plurality of channel values at a particular time is a numerical representation of the channel at that instance).

35 U.S.C. 102(b) rejection of claim 6.

See output MUX in Figure 5 of Kaul.

35 U.S.C. 102(b) rejection of claim 25.

See figure 5 in Kaul.

35 U.S.C. 102(b) rejection of claim 28.

Demodulator 28 in Figure 1 of Kaul.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 2-4 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul) in view of Jeong; Gibong (US 6907084 B2).

35 U.S.C. 103(a) rejection of claim 2.

Kaul substantially teaches the claimed invention described in claim 1 (as rejected above). Note: Kaul teaches dual channel TDMA communication typically found in many communication protocols such as QAM (one of the more commonly used dual communication protocols used for TDMA) over a bursty channel.

However Kaul does not explicitly teach the specific use of the first and second values are QAM In-phase I and Quadrature Q values.

Jeong, in an analogous art, teaches use of the first and second values are QAM In-phase I and Quadrature Q values (see Figure 1 in Jeong).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kaul with the teachings of Jeong by including use of the first and second values are In-phase I and Quadrature Q values. This modification

would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of the first and second values are In-phase I and Quadrature Q values would have provided a commonly used dual channel modulation technique for the TDMA communication system taught in Kaul (col. 4, lines 25-35 in Jeong).

35 U.S.C. 103(a) rejection of claim 3.

Block 122 in Figure 1 in Jeong.

35 U.S.C. 103(a) rejection of claim 4.

Figure 4 and Abstract in Jeong.

35 U.S.C. 103(a) rejection of claim 26.

Decoder 124 in Figure 1 of Jeong receives fourth values to decode fifth values.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul) in view of Ross; Daniel P. (US 4901319 A).

35 U.S.C. 103(a) rejection of claim 7.

Kaul substantially teaches the claimed invention described in claim 1 (as rejected above).



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However Kaul does not explicitly teach the specific use of a adaptive interleaving.

Ross, in an analogous art, teaches use of a adaptive interleaving (Abstract in Ross).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kaul with the teachings of Ross by including use of a adaptive interleaving. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a adaptive interleaving would have provided the ability to adjust interleaving to channel conditions (Abstract in Ross).

6. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul) and Ross; Daniel P. (US 4901319 A) in view of Jeong; Gibong (US 6907084 B2).

35 U.S.C. 103(a) rejection of claim 8.

Kaul and Ross substantially teaches the claimed invention described in claims 1 and 7 (as rejected above). Note: Kaul teaches dual channel TDMA communication typically found in many communication protocols such as QAM (one of the more commonly used dual communication protocols used for TDMA) over a bursty channel.

However Kaul and Ross does not explicitly teach the specific use of the first and second values are QAM In-phase I and Quadrature Q values.

Jeong, in an analogous art, teaches use of the first and second values are QAM In-phase I and Quadrature Q values (see Figure 1 in Jeong).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kaul and Ross with the teachings of Jeong by including use of the first and second values are In-phase I and Quadrature Q values. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of the first and second values are In-phase I and Quadrature Q values would have provided a commonly used dual channel modulation technique for the TDMA communication system taught in Kaul (col. 4, lines 25-35 in Jeong).

35 U.S.C. 103(a) rejection of claim 9.

Col. 4, lines 1-3 in Jeong.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul) and Ross; Daniel P. (US 4901319 A) in view of Khayrallah; Ali S. et al. (US 6798852 B2, hereafter referred to as Khayrallah).

35 U.S.C. 103(a) rejection of claim 10.

Kaul and Ross substantially teaches the claimed invention described in claims 1 and 7 (as rejected above). Note: Kaul teaches dual channel TDMA communication typically found in many communication protocols such as QPSK (one of the more commonly used dual communication protocols used for TDMA) over a bursty channel.

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However Kaul and Ross does not explicitly teach the specific use of the first and second values are QPSK In-phase I and Quadrature Q values.

Khayrallah, in an analogous art, teaches use of the first and second values are QPSK In-phase I and Quadrature Q values (see col. 3, lines 20-25 in Jeong).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kaul and Ross with the teachings of Khayrallah by including use of the first and second values are In-phase I and Quadrature Q values.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of the first and second values are In-phase I and Quadrature Q values would have provided a commonly used dual channel modulation technique for the TDMA communication system taught in Kaul (col. 3, lines 20-25 in Khayrallah).

8. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul) and Ross; Daniel P. (US 4901319 A) in view of Zehavi; Ephraim (US 6496543 B1).

35 U.S.C. 103(a) rejection of claims 11 and 12.

Kaul and Ross substantially teaches the claimed invention described in claims 1 and 7 (as rejected above).

However Kaul and Ross do not explicitly teach the specific use of 1/3 or 1/5 rate encoding.

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Zehavi, in an analogous art, teaches use of  $1/3$  or  $1/5$  rate encoding (col. 9, lines 1-5 in Zehavi).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kaul and Ross with the teachings of Zehavi by including use of  $1/3$  or  $1/5$  rate encoding. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of  $1/3$  or  $1/5$  rate encoding would have provided a means for varying encoding rate to match channel conditions (col. 9, lines 1-5 in Zehavi).

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul) in view of Shiu; Da-shan et al. (US 6392572 B1, hereafter referred to as Shiu).

35 U.S.C. 103(a) rejection of claim 13.

Kaul substantially teaches the claimed invention described in claim 1 (as rejected above).

However Kaul does not explicitly teach the specific use of memory banks sized in accordance with one or more encoder packet sizes.

Shiu, in an analogous art, teaches use of memory banks sized in accordance with one or more encoder packet sizes (Claim 1 in Shiu).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kaul with the teachings of Shiu by including use of memory banks sized in accordance with one or more encoder packet sizes. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of memory banks sized in accordance with one or more encoder packet sizes would have provided a means for interleaving packet data (Claim 1 in Shiu).

10. Claims 14, 15, 20, 21, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul).

35 U.S.C. 103(a) rejection of claims 14 and 15.

Kaul substantially teaches the claimed invention described in claim 1 (as rejected above).

However Kaul does not explicitly teach the specific use of the storing pattern comprises a plurality of cycles.

The Examiner asserts that interleaving is a method of spacing adjacent bits a given distance from each other to improve burst error correction. There are many obvious mathematical and algorithmic ways to specify the interleave spacing without deviating from what is already known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Kaul by including use of the storing

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pattern comprises a plurality of cycles. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of the storing pattern comprises a plurality of cycles would have provided a means for specifying the spacing of the interleaver (There are many obvious mathematical and algorithmic ways to specify the interleave spacing without deviating from what is already known in the art).

35 U.S.C. 103(a) rejection of claim 20.

Figure 5 teaches two channel for a 4-bit symbol.

35 U.S.C. 103(a) rejection of claim 21.

Kaul substantially teaches the claimed invention described in claim 1 (as rejected above).

However Kaul does not explicitly teach the specific use of multiplexer for implementing the S/P block in Figure 5 of Kaul.

The Examiner asserts that Multiplexers are one of the most common devices in the art for selecting and modifying data from one format to another.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Kaul by including use of multiplexer for implementing the S/P block in Figure 5 of Kaul. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of multiplexer for

implementing the S/P block in Figure 5 of Kaul would have provided one of the most common devices in the art for selecting and modifying data from one format to another as required by the S/P block in Figure 5 of Kaul.

35 U.S.C. 103(a) rejection of claims 23 and 24.

The Examiner asserts that interleaving is a method of spacing adjacent bits a given distance from each other to improve burst error correction. There are many obvious mathematical and algorithmic ways to specify the interleave spacing without deviating from what is already known in the art.

11. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul) in view of Haoui; Amine et al. (US 5742640 A, hereafter referred to as Haoui).

35 U.S.C. 103(a) rejection of claim 22.

Kaul substantially teaches the claimed invention described in claim 1 (as rejected above).

However Kaul does not explicitly teach the specific use of a tri-state bus.

Haoui, in an analogous art, teaches use of a tri-state bus (MUX 106 in Figure 4 and col. 4, lines 14-19 of Haoui).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kaul with the teachings of Haoui by including use of a tri-

state bus. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a tri-state bus would have provided a means for implementing a MUX (col. 4, lines 14-19 of Haoui; Note: the S/P block in Figure 5 of Kaul is substantially a MUX).

12. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul) and Jeong; Gibong (US 6907084 B2) in view of Khayrallah; Ali S. et al. (US 6798852 B2, hereafter referred to as Khayrallah).

35 U.S.C. 103(a) rejection of claim 27.

Kaul and Jeong substantially teaches the claimed invention described in claims 1 and 26 (as rejected above).

However Kaul and Jeong does not explicitly teach the specific use of a turbo decoder.

Khayrallah, in an analogous art, teaches use of a turbo decoder (Figure 7 in Khayrallah).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kaul and Jeong with the teachings of Khayrallah by including use of a turbo decoder. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill



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in the art would have recognized that use of a turbo decoder would have provided near Shannon limit error correction.

13. Claims 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul).

35 U.S.C. 103(a) rejection of claim 31.

Kaul substantially teaches the claimed invention described in claim 30 (as rejected above).

However Kaul does not explicitly teach the specific use of an algorithm for interleaving.

The Examiner asserts that interleaving is a method of spacing adjacent bits a given distance from each other to improve burst error correction. There are many obvious mathematical and algorithmic ways to specify the interleave spacing without deviating from what is already known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Kaul by including use of an algorithm for interleaving. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of an algorithm for interleaving would have provided a means for specifying the spacing of the interleaver (There are many obvious mathematical and algorithmic ways to specify the interleave spacing without deviating from what is already known in the art).

35 U.S.C. 103(a) rejection of claim 32.

The Examiner asserts that interleaving is a method of spacing adjacent bits a given distance from each other to improve burst error correction. There are many obvious mathematical and algorithmic ways to specify the interleave spacing without deviating from what is already known in the art.

35 U.S.C. 103(a) rejection of claim 33.

Col. 8, lines 61-68 in Kaul.

14. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaul; Pradman et al. (US 4063038 A, hereafter referred to as Kaul) in view of Jeong; Gibong (US 6907084 B2).

35 U.S.C. 103(a) rejection of claim 34.

Kaul substantially teaches the claimed invention described in claims 30 and 33 (as rejected above).

However Kaul does not explicitly teach the specific use of a decoder to receive data from the interleaver.

Jeong, in an analogous art, teaches use of a decoder to receive data from the interleaver.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kaul with the teachings of Jeong by including use of a decoder to receive data from the interleaver. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a decoder to receive data from the interleaver would have provided a means for correcting errors.

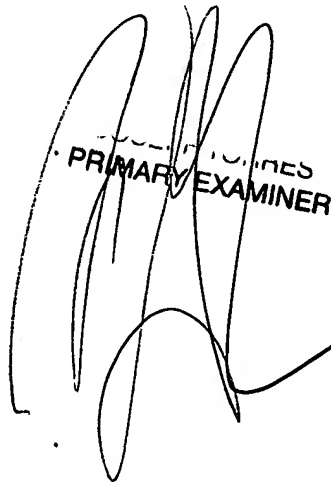
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JOSEPH D. TORRES  
PRIMARY EXAMINER

Joseph D. Torres, PhD  
Primary Examiner  
Art Unit 2133